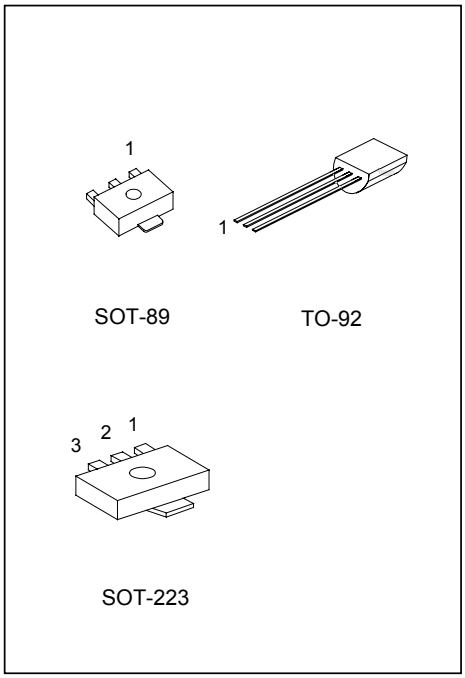
UTC UR133/A LINEAR INTEGRATED CIRCUIT

300/500mA LOW DROPOUT LINEAR VOLTAGE REGULATOR



DESCRIPTION

The UTC UR133/A is a 300/500mA fixed output voltage low dropout linear regulator. Wide range of available output voltage fits most of applications. Built-in output current-limiting most thermal-limiting provide maximal protection against any fault conditions.

FEATURES

*Guaranteed 300/500mA output current
*Input voltage range up to 12V
*Extremely tight load regulation
*Fast transient response
*Current-limiting and Thermal-limiting
*Three-terminal adjustable or fixed 1.5V, 1.8V,2.2V, 2.5V, 2.7V , 2.8V , 2.9V ,3.0V, 3.3V , 3.5V , 3.7V , 4.7V , 5.0V

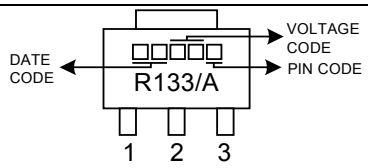
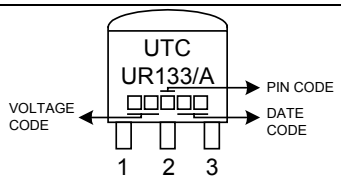
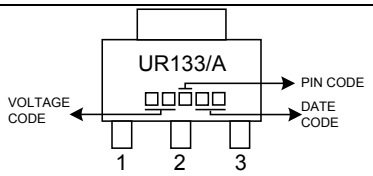
APPLICATIONS

*Voltage regulator for LAN Card, CD-ROM, and DVD
*Wireless communication systems

PIN DESCRIPTION

NAME	FUNCTION
VOUT	Output
GND	Ground/Adjustable
VIN	Positive Power Input

MARKING INFORMATION

PACKAGE	VOLTAGE CODE	PIN CODE	PIN 1	PIN 2	PIN 3	MARKING
SOT-89	15:1.5V 18:1.8V 22:2.2V 25:2.5V 27:2.7V 28:2.8V	A	GND	OUT	IN	
		B	OUT	GND	IN	
		C	GND	IN	OUT	
		D	IN	GND	OUT	
TO-92	29:2.9V 30:3.0V 33:3.3V 35:3.5V 37:3.7V 47:4.7V 50:5.0V AD: ADJUSTABLE	A	GND	OUT	IN	
		B	OUT	GND	IN	
		C	GND	IN	OUT	
		D	IN	GND	OUT	
SOT-223		A	GND	OUT	IN	
		B	OUT	GND	IN	
		C	GND	IN	OUT	
		D	IN	GND	OUT	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	TYP.	MAX.	UNIT
Input Voltage Vin	-0.3		12	V
Operating Junction Temperature Range	-40		125	°C
Storage Temperature Range	-65		150	°C
Power Dissipation				W
SOT-89		0.50		
Thermal Resistance, R_{OJC}=100°C/W				
Thermal Resistance, R_{OJA}=300°C/W				
TO-92		0.60		
Thermal Resistance, R_{OJA}=160°C/W				
SOT-223		0.80		
Thermal Resistance, R_{OJC}=15°C/W				
Thermal Resistance R_{OJA}=60°C/W (est)				

UTC UR133/A 1.5V, 1.8V, 2.2V, 2.5V, 2.7V, 2.8V, 2.9V,3.0V

ELECTRICAL CHARACTERISTICS (Ta=25°C, C_{IN}=1μF, C_{OUT}=10μF, unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS
Output Voltage UR133/A	I_L=1mA, $V_{IN-VOUT}$=1.4V	1.47	1.50	1.53	V
		1.77	1.80	1.83	
		2.16	2.20	2.24	
		2.45	2.50	2.55	
		2.65	2.70	2.75	
		2.74	2.80	2.86	
		2.84	2.90	2.96	
		2.94	3.00	3.06	
Output Voltage Temperature Coefficient			50	150	PPM/°C
Line Regulation	I_L=1mA, V_{IN}-Vout=2V~Vin=9V			0.5	%V_{OUT}
Load Regulation (note 2) UR133	I_L=1mA~300mA, V_{IN}-Vout =2V		10	30	mV
UR133A	I_L=1mA~500mA, V_{IN}-Vout =2V		10	50	mV
Current Limit (note 3)	$V_{IN-Vout}$=2V, V_{OUT}=0V				
UR133		350			mA
UR133A		550			mA
Dropout Voltage (note 4,5)				1.5	V
Standby current	I_L=0, V_{IN}=9V			3.0	mA

UTC UR133/A ADJ 3.3V, 3.5V, 3.7V, 4.7V, 5.0V

ELECTRICAL CHARACTERISTICS (Ta=25°C, C_{IN}=1μF, C_{OUT}=10μF, unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS
Adjustable (R1=120Ω,R2=200Ω,Vout=3.3V)					
Reference Voltage	Vin-Vo=2V, I_L=1mA	1.238	1.250	1.262	V
Output Voltage UR133/A	I_L=1mA, $V_{IN-VOUT}$=1.4V	3.23	3.30	3.37	V
		3.43	3.50	3.57	
		3.63	3.70	3.77	
		4.61	4.70	4.79	
		4.90	5.00	5.10	
Output Voltage Temperature Coefficient			50	150	PPM/°C
Line Regulation	I_L=1mA, V_{IN}-Vout=2V~Vin=12V			0.5	%V_{OUT}
Load Regulation (note 2) UR133	I_L=1mA~300mA, V_{IN}-Vout =2V		10	30	mV
UR133A	I_L=1mA~500mA, V_{IN}-Vout =2V		10	50	mV
Current Limit (note 3)	$V_{IN-Vout}$=2V, V_{OUT}=0V				
UR133		350			mA
UR133A		550			mA
Dropout Voltage (note 4,5)				1.3	V
Standby current	I_L=0, V_{IN}=12V			5.0	mA

Note 1: Guaranteed by design.

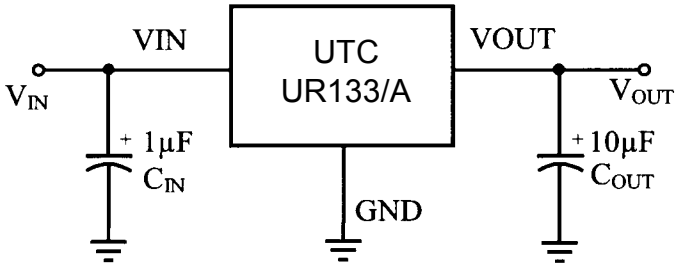
Note 2: Regulation is measured at constant junction temperature, using pulsed ON time.

Note 3: Current Limit is measured at constant junction temperature, using pulsed ON time.

Note 4: Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{OUT} inside target value±2%.

Note 5: Dropout test is skipped at the condition of V_{IN}<3V.

TYPICAL APPLICATION CIRCUIT

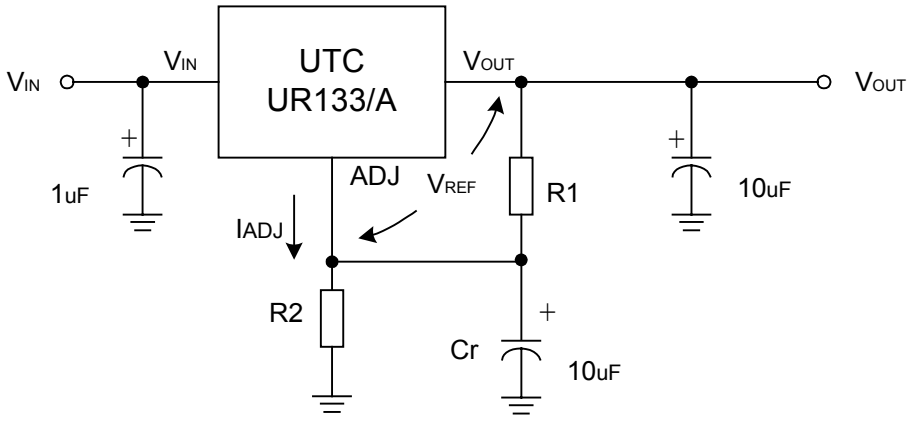


APPLICATION INFORMATION

A 10μF (or larger) capacitor is recommended between VOUT and GND for stability. The part may oscillate without the capacitor. Any type of capacitor can be used, but not Aluminum electrolytics when operating below -25°C. The capacitance may be increased without limit.

A 1μF capacitor (or larger) should be placed between VIN to GND.

UR133/A ADJUSTABLE

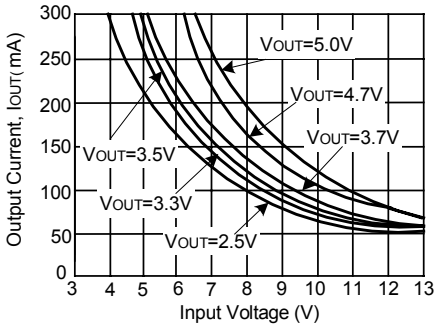


Cr:10uF to improve ripple rejection

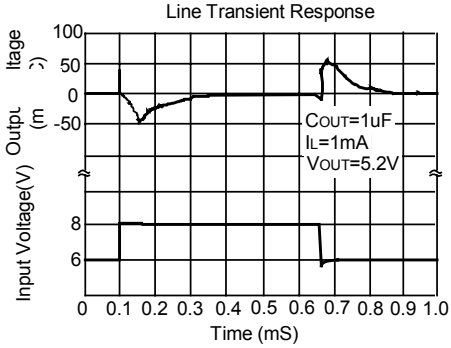
VOUT=VREF(1+R2/R1)+IADJ*R2

UR133

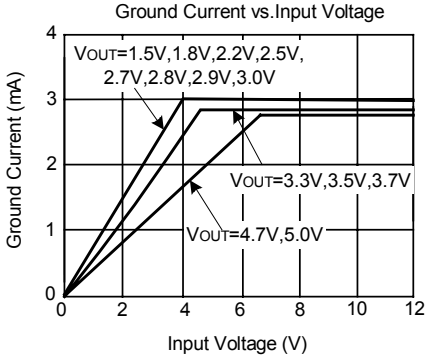
Output Current v.s. Input Voltage



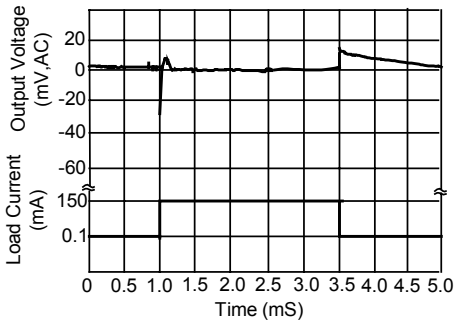
Line Transient Response



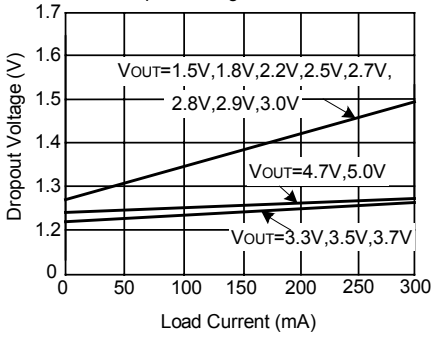
Ground Current vs.Input Voltage



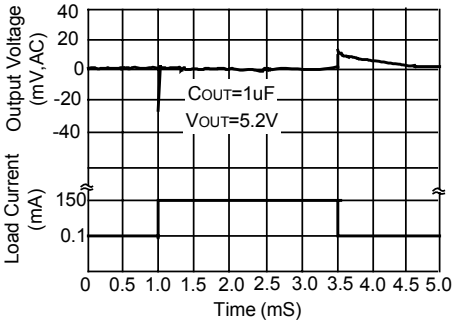
Load Transient Response



Dropout Voltage vs.Load Current

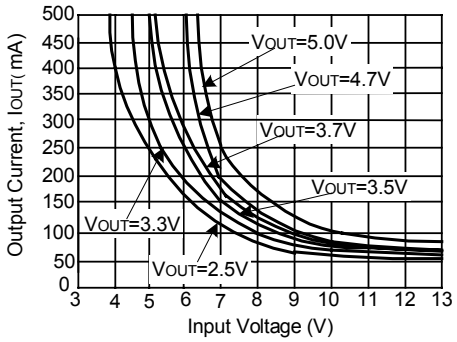


Load Transient Response

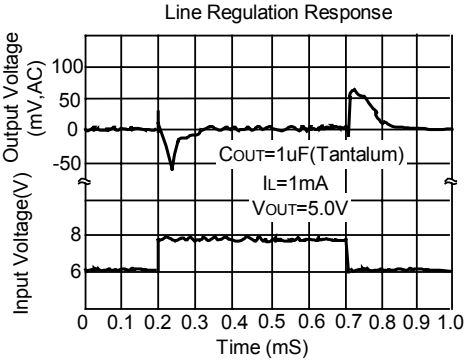


UR133A

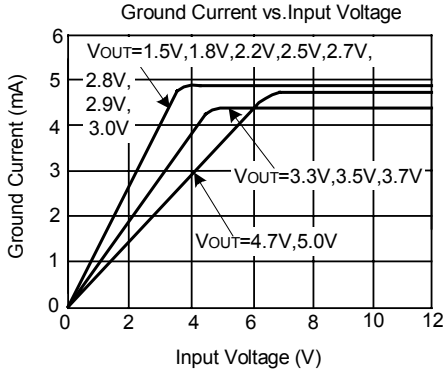
Output Current v.s. Input Voltage



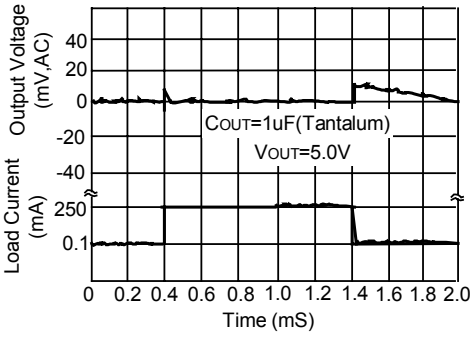
Line Regulation Response



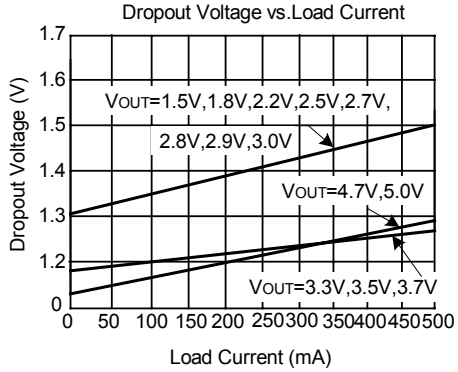
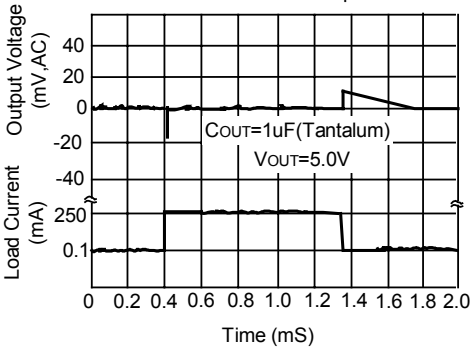
Ground Current vs.Input Voltage



Load Transient Response



Dropout Voltage vs.Load Current



Load Transient Response